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Endocrine Cells in Gastric Carcinoma

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SUMMARY

Argentaffin cells were found in 2% of intestinal and 8% of diffuse, argyrophil cells in 6% of intestinal type and 33% of diffuse type gastric carcinoma. Neoplastic cells containing neuroendocrine-type secretory granules were seen by electron microscopy. The findings indicate that gastric carcinoma cells are capable of differentiating to endocrine cells.

Key words: Argentaffin cells, Argyrophil cells, Electron microscopy, Diffuse type gastric carcinoma, Intestinal type gastric carcinoma

INTRODUCTION

The normal human gastric mucosa contains at least four morphological types of endocrine cells: G (gastrin), ECL (enterochromaffin-like), Ec (enterochromaffin), and D (D-like) cells, most of which are located in the pyloric antrum (8). Endocrine cells are found also in the intestinal metaplasia of gastric mucosa (1, 6). Tumours consisting of endocrine cells-variably classified as carcinoids, neuroendocrine or APUD tumours-are infrequently found in the stomach (4). Endocrine cells have been occasionally found also in gastric carcinomas (7, 9). The purpose of the present investigation was to study the occurrence and ultrastructure of endocrine cells in gastric carcinoma.

MATERIAL AND METHODS

Specimens were obtained from stomachs resected for gastric carcinoma. The histological classification of gastric carcinoma was done according to Laurén (5). Samples for histology was fixed in formalin and embedded in paraffin. Sections were stained with H-E or van Gieson. Argentaffinity was demonstrated by Fontana (Masson-Hamperl) staining and argyrophilia by Bodian staining. The former staining was performed in 92 cases and the latter in 128 cases. Samples for electron microscopy (54 cases) were fixed in glutaraldehyde and osmium tetroxide and embedded in Epon. Sections were contrasted by uranyl acetate and lead

citrate.

RESULTS

The results of the histological observations are summarized in Table 1. Argentaffin cells were found in 11% of cases and argyrophil cells in 18% of cases. Both endocrine cell types were more common in the diffuse type than in the intestinal type carcinoma.

Electron microscopy disclosed cells with neuroendocrine-type secretory granules in 2 cases of diffuse type carcinoma. The cells containing these granules displayed neoplastic characteristics such as large, irregular nuclei and relatively abundant cytoplasm (Fig. 1). The secretory granules were round, homogeneous and approximately 350-370 nm in diameter (Fig. 2).

Table 1 *Occurrence of endocrine cells in gastric carcinoma.*

Type of carcinoma	Argentaffin cells						Argyrophil cells					
	Number of cases	−	+	++	Total positive	%	Number of cases	−	+	++	Total positive	%
Intestinal type	50	49	−	1	1	2	82	77	2	3	5	6
Diffuse type	25	23	−	2	2	8	48	32	4	12	16	33
Unclassified	17	17	−	−	−	0	21	19	2	−	2	11

−, negative staining; +, weak positive staining; ++, strong positive staining.

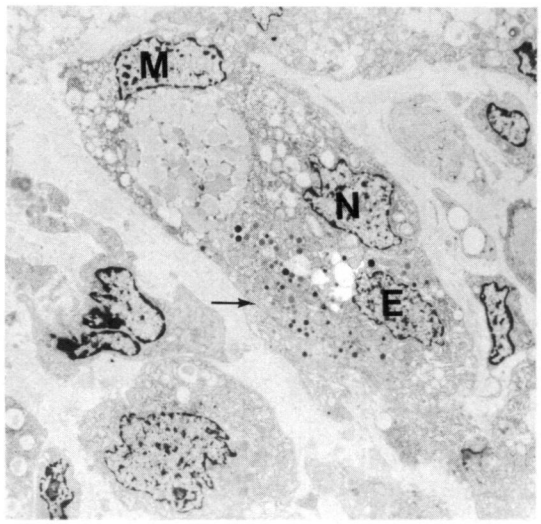

Fig. 1 A mucin-producing (M), a non-secretory (N), and an endocrine cell (E) in diffuse type gastric carcinoma. Note the irregular nuclei and the small, round, neuroendocrine-type secretory granules (arrow). Magnification 2000×.

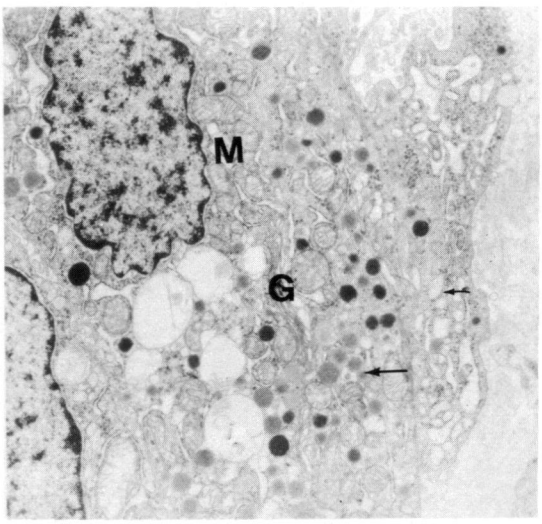

Fig. 2 Numerous small, round neuroendocrine-type secretory granules in the cytoplasm of a neoplastic cell in diffuse type carcinoma (arrows). G, Golgi apparatus; M, mitochondria. Magnification 6000×.

DISCUSSION

Argentaffin and argyrophil cells were found relatively frequently in gastric carcinomas in the present study. Argyrophil cells were found in one-third of diffuse type carcinomas. The over-all frequency of occurrence of endocrine cells in gastric carcinoma observed in the present study corresponds well to earlier observations. Proks and Feit (7) found Fontana-positive (argentaffin) cells in 2.65% of tubular and 17.4% of diffuse type gastric carcinomas and Grimelius-positive (argyrophil) cells in 5.3% of tubular and 17.4% of diffuse type carcinomas. Tahare *et al.* (9) found argyrophil cells in 18% of cases of early gastric carcinoma.

Electron microscopy disclosed in the tumours endocrine cells that were not merely non-neoplastic cells trapped among the proliferating cancer cells but were obviously cells with neoplastic ultrastructural features. The classification of the neoplastic endocrine cell types was not unequivocal in the present study. However, the ultrastructure of the secretory granules corresponded to that described in the D cell of the normal gastrointestinal tract (2). For technical reasons it was impossible to obtain direct proof in the present study that the endocrine cells seen in the electron microscope were the same cells that were argentaffin or argyrophil in the paraffin sections. However, such correlative studies have been performed earlier (3, 2). The present findings indicate that the cell of origin in gastric carcinoma, both in the intestinal and diffuse type, is capable of differentiating not only to a mucin-producing cell types but also to endocrine cells.

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